

## CLAIMS

1. A process for the preparation of anisotropic  
5 aggregates of silica which comprises the following stages:
  - a) at least one polymer is brought into contact with  
silica particles which are nonaggregated and/or  
which exhibit a high degree of dispersion in an  
10 aqueous medium, with a ratio R, weight of polymer  
with respect to the surface area of the silica  
particles, of between 0.02 and 2 mg/m<sup>2</sup>, the value of  
the electrostatic charge of the surface of the  
silica particles being greater than or equal to the  
15 value of the charge of the surface of the silica  
particles measured in an aqueous phase without added  
salts at a pH of greater than or equal to 7;
  - b) the aggregates obtained in stage a) are  
consolidated, either by a heat treatment or by  
20 precipitation of an inorganic compound.
2. The process as claimed in claim 1, characterized in  
that stage a) is carried out with a ratio R, weight  
of polymer to surface area of the silica particles,  
25 of between 0.05 and 1.8 mg/m<sup>2</sup>.
3. The process as claimed in either of the preceding  
claims, characterized in that use is made of a  
silica sol for which the size of the silica  
30 particles is between 3 and 50 nm, preferably between  
5 and 20 nm.
4. The process as claimed in one of the preceding  
claims, characterized in that use is made of a

polymer chosen from homopolymers, copolymers, linear polymers, dendrimers or grafted polymers.

5. The process as claimed in claim 4, characterized in that use is made of a polymer chosen from the list consisting of the group of following polymers:  
polyoxyethylene (POE), poly(vinyl alcohol) (PVA),  
polyvinylpyrrolidone (PVP), polyacrylamide (PAM),  
polymethacrylamides, poly(N-isopropylacrylamide)  
10 (PNIPAM) and other N-substituted derivatives, polysaccharides, in particular amylose or dextran, guar and derivatives, modified celluloses, polyvinylpyrrolidone-poly(acrylic acid) (PVP-PAA), polyoxyethylene-poly(acrylic acid) (POE-PAA), poly-  
15 acrylamide-polyvinylpyrrolidone (PAM-PVP), polyvinylamine, polydiallyldimethylammonium (PDADMAC), polyacrylamide-polydiallyldimethylammonium (PAM-PDADMAC), polymers based on quaternized or nonquaternized amines, in particular polyethyleneimine, and its copolymers with nonionic or anionic  
20 monomers, polyvinylimidazole, poly(aminoalkyl acrylate)s and poly(aminoalkyl methacrylate)s, random or grafted copolymers of anionic monomers, such as acrylic or methacrylic acid, with cationic or nonionic  
25 monomers, and carboxymethylated polysaccharides.
6. The process as claimed in one of the preceding claims, characterized in that, in stage b), a heat treatment is carried out at a temperature of at  
30 least 80°C, more particularly of at least 100°C, preferably of at least 120°C.
7. The process as claimed in one of the preceding claims, characterized in that, in stage b), the  
35 precipitation of an inorganic compound chosen from silicates, phosphates, silicophosphates, aluminates,

silicoaluminates, cerium, zinc, iron, titanium, zirconium, carbonates, rare earths, divalent cations or their mixtures is carried out.

- 5    8.    The process as claimed in claim 7, characterized in that the inorganic compound is a sodium silicate exhibiting an  $\text{SiO}_2/\text{Na}_2\text{O}$  ratio by weight  $R_w$  of between 0.5 and 4.
- 10   9.    The process as claimed in claim 7 or 8, characterized in that the precipitation of the silicate is carried out by simultaneously adding the silicate to be precipitated and an acidifying agent, so as to maintain the pH at a value of at least 6.
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10.   The process as claimed in claim 9, characterized in that an acidifying agent chosen from sulfuric acid, nitric acid or hydrochloric acid, or an organic acid, such as acetic acid, formic acid or carbonic acid, is added.
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11.   The process as claimed in one of the preceding claims, characterized in that use is made, as polymer, of poly(N-isopropylacrylamide).
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12.   A product capable of being obtained by the process of claim 11.
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13.   An aggregate of silica comprising a sequence of individual silica particles for which the number of particles is between 5 and 15, for which at least 80% of the individual particles are in contact with at most 2 particles and for which the greatest distance measurable between 2 points of the aggregate is less than or equal to 5 times the mean size of an individual particle.
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14. The use of the product as claimed in claim 12 or 13  
as reinforcing filler for a composition formed of  
polymers, in particular of plastics and of rubber,  
5 viscosifying, texturizing or anticaking agent,  
anticracking agent, in particular in the petroleum  
field, polishing agent, in particular for  
toothpastes and paper, coating agent, in particular  
in the textile field, active material absorbent,  
10 catalyst support or component for battery  
separators.